

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-205413

(43)Date of publication of application : 23.07.2002

(51)Int.Cl.

B41J 2/175

(21)Application number : 2001-003412

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(22)Date of filing : 11.01.2001

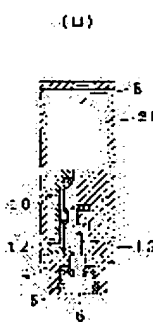
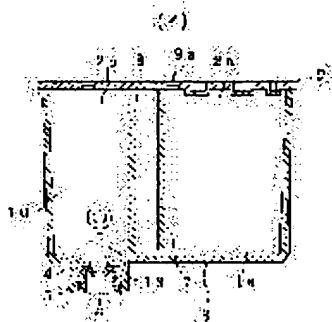
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(54) INK CARTRIDGE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an ink cartridge suitable for a pigment ink capable of preventing deposition of a pigment in the ink and bubbling of the ink.

SOLUTION: An ink housing chamber is divided into a large chamber 1a having a large capacity and a small chamber 1b having a small capacity by a wall. An ink supply hole 4 is provided so as to communicate with the small chamber 1b. A fluid passage 11 for allowing the ink to flow into the small chamber 1b from the bottom of the large chamber 1a is formed.



LEGAL STATUS

[Date of request for examination] 26.01.2004

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than withdrawal the examiner's decision of rejection or application converted registration]

[Date of final disposal for application] 14.02.2006

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision
of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

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1.This document has been translated by computer. So the translation may not reflect the original
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2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The ink cartridge in which the passage which a wall divides [passage] said ink hold
room into Omuro with one large volume and areole with the small volume of another side, said
ink feed hopper is prepared [passage] in the ink cartridge by which the ink feed hopper which
supplies ink to a recording head was formed in one field of the container which forms an ink
hold room, and said container so that it may be open for free passage to said areole, and makes
ink flow into areole from said Omuro's pars basilaris ossis occipitalis is formed.

[Claim 2] The ink cartridge according to claim 1 by which the filter is arranged in said passage.

[Claim 3] The ink cartridge according to claim 1 by which the floating body is arranged at least
at said Omuro.

[Claim 4] The ink cartridge according to claim 1 in which the width of face of the migration
direction of said carriage of said areole is formed more narrowly than said Omuro's width of
face.

[Claim 5] The ink cartridge according to claim 1 to which said ink feed hopper and said areole
are connected through the differential pressure regulating valve.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The field of the technique in which invention belongs] This invention is carried in carriage and
relates to the ink cartridge which supplies ink to an ink jet recording head.

[0002]

[Description of the Prior Art] If it is in the ink jet recording apparatus which carried the ink cartridge in carriage, there is a problem that big acceleration acts on an ink cartridge by reciprocation of carriage, and foaming arises in ink. In order to solve such a problem, the ink cartridge which held at least the porous body of an ink stockroom which can hold ink by the capillary tube force in the field by the side of an ink feed hopper is proposed.

[0003]

[Problem(s) to be Solved by the Invention] On the other hand, in order to aim at improvement in the color enhancement of ink, or lightfastness, the so-called pigment ink which mixed the coloring particle in the state of suspension to the ink solvent is also going to be put in practical use. If it is in the ink containing such a particle, it is easy to carry out the deposition of the pigment contained in ink to a porous body, and there is a problem that the color enhancement of the ink supplied to a recording head falls. The place which this invention is made in view of such a problem, and is made into the purpose is offering the ink cartridge suitable for the pigment ink which can prevent foaming of ink as the pigment contained in ink is self-possessed.

[0004]

[Means for Solving the Problem] In order to solve such a problem, it sets to this invention. In the ink cartridge by which the ink feed hopper which supplies ink to a recording head was formed in one field of the container which forms an ink hold room, and said container The passage which a wall divides [passage] said ink hold room into Omuro with one large volume and areole with the small volume of another side, said ink feed hopper is prepared [passage] so that it may be open for free passage to said areole, and makes ink flow into areole from said Omuro's pars basilaris ossis occipitalis is formed.

[0005]

[Function] While supplying the ink which does not contain the bubble of Omuro's pars basilaris ossis occipitalis to areole, foaming of the ink which stops ***** of areole and is supplied to a recording head is prevented.

[0006]

[Embodiment of the Invention] Drawing 1 and drawing 2 show one example of the ink cartridge of this invention, respectively, the ink hold room 2 is formed in the container 1 with which an opening side serves as breadth at last a little and which was constituted by carrying out injection molding of the polymeric materials of a rectangular parallelepiped mostly, and the ink feed hopper 4 which engages with the ink supply needle of a recording head at a pars basilaris ossis occipitalis 3 is formed.

[0007] the ink supply needle which is open for free passage to the ink feed hopper 4 at a recording head, and liquid -- it is loaded with the annular packing 5 engaged densely, and the closure of the outside is carried out with the film 6 which can insert in an ink supply needle.

[0008] As for the ink hold room 2, ink is separated into Omuro 2a and areole 2b by the septa 7 and 8 of two sheets movable by the siphon phenomenon, respectively. That is, the septum 8 which the closure of the septum 7 located in the Omuro side is carried out by the rear face of a lid 9 in the upper part, and carries out opening at the pars basilaris ossis occipitalis 3, and is located in an areole side is preferably formed in a container 1 and one so that it may extend from a pars basilaris ossis occipitalis 3 and the upper part may carry out opening. Thus, separated areole 2b is opened for free passage by the ink feed hopper 4 through the differential pressure regulating valve 10 mentioned later. In addition, Omuro 2a is wide opened by atmospheric air through atmospheric-air free passage hole 9a of a lid 9.

[0009] Drawing 3 (b) and (b) are constituted by the valve element 15 which shows one example

of the above-mentioned differential pressure regulating valve 10 in the state of a clausilium condition and valve opening, and was always energized with the spring 13 between the ink input 11 and the ink tap hole 12 at the ink input 11 side, and equipped the core with the through tube 14, and the valve seat 16 which closes the through tube 14 of a valve element 15.

[0010] Thus, if ink is consumed by the recording head, since the pressure of the ink tap hole 12 will decline, from a valve seat 16, it separates and the constituted differential pressure regulating valve 10 is opened, as a valve element 15 resists the energization force of a spring 13 and it was shown in drawing 3 (b).

[0011] Moreover, if it goes up until it is in agreement with the differential pressure to which the pressure of the ink tap hole 11 is set with the spring 13, as shown in drawing 3 (b), a valve element 15 will be overcome by the energization force of a spring 13, will be ****(ed) by the valve seat 16, and the valve will be closed.

[0012] In this example, if an ink cartridge is carried in carriage and printing is started, acceleration will act on the ink of each ** 2a and 2b by reciprocation of carriage, but since there is little rocking of the ink of areole 2b, foaming is hardly produced (drawing 4 (**)). On the other hand, in Omuro 2a, since ink is choppy, although air bubbles are generated, precipitate of a pigment is prevented as much as possible.

[0013] If the ink of areole 2b is consumed by the recording head with printing, a differential pressure regulating valve 10 will open and the ink of areole 2b will be consumed. the passage 17 by which partition formation was carried out by the septa 7 and 8 of two sheets when consumption of the ink of areole 2b progressed -- minding -- the ink of the pars basilaris ossis occipitalis of Omuro 2a -- areole 2b -- flowing in -- just -- being alike -- ink breaks off in the pars basilaris ossis occipitalis 3 of Omuro 2a, and the point of a septum 7 (drawing 4 (**)). The bubble of Omuro 2a seems not to flow into areole 2b, since the ink of the field of pars-basilaris-osis-occipitalis 1a flows in even if the bubble exists in the ink K of Omuro 2a from the first.

[0014] Drawing 5 shows other examples of this invention, in this example, in the middle of passage 17, a filter 18 is arranged at the input side of passage 17, and the floating body 19 is arranged at least still more preferably in this example at Omuro 2a.

[0015] According to this example, since a bubble is eliminated with a filter 18 and ***** of the ink of Omuro 2a is controlled by the floating body 19, the inflow of the air bubbles to a recording head can be prevented much more certainly.

[0016] In addition, in an above-mentioned example, although the ink cartridge in which the single ink hold room 2 was formed was explained, even if it applies to the ink cartridge in which only two or more ink rooms were formed, the same operation is done so. Moreover, although the valve element 15 is perpendicularly arranged in an example to ****, even if it arranges horizontally, it is clear to do the same operation so.

[0017] Furthermore, although areole 1b and the ink feed hopper 4 were made to open for free passage by the differential pressure regulating valve in an above-mentioned example, the supply pressure of the ink to a recording head was maintained to negative pressure and leakage of the ink from a recording head is prevented, when ink can fully be held with the meniscus of the nozzle orifice of a recording head, a differential pressure regulating valve becomes unnecessary.

[0018] ***** in areole 2b can be stopped much more certainly by even a wall's 10 extending the base 20 which constitutes a differential pressure regulating valve 10 as furthermore shown in drawing 6 , and narrowing width of face W of the migration direction of areole 2b by the technique of inserting in packing.

[0019]

[Effect of the Invention] In the ink cartridge by which the ink feed hopper which supplies ink to a recording head was formed in one field of the container which forms an ink hold room, and a container in this invention as explained above Since the passage which a wall divides [passage] an ink hold room into Omuro with one large volume and areole with the small volume of another side, an ink feed hopper is prepared [passage] so that it may be open for free passage to areole, and makes ink flow into areole from Omuro's pars basilaris ossis occipitalis is formed While supplying the ink which does not contain the bubble of Omuro's pars basilaris ossis occipitalis to areole, ***** of areole can be stopped, foaming can be prevented and the inflow of the air bubbles to a recording head can be prevented. Moreover, the inflow of the ink to a recording head can be prevented, preventing precipitate of a pigment using rocking of the ink in Omuro positively.

TECHNICAL FIELD

[The field of the technique in which invention belongs] This invention is carried in carriage and relates to the ink cartridge which supplies ink to an ink jet recording head.

PRIOR ART

[Description of the Prior Art] If it is in the ink jet recording apparatus which carried the ink cartridge in carriage, there is a problem that big acceleration acts on an ink cartridge by reciprocation of carriage, and foaming arises in ink. In order to solve such a problem, the ink cartridge which held at least the porous body of an ink stockroom which can hold ink by the capillary tube force in the field by the side of an ink feed hopper is proposed.

EFFECT OF THE INVENTION

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the ink supplied to a recording head falls. The place which this invention is made in view of such a problem, and is made into the purpose is offering the ink cartridge suitable for the pigment ink which can prevent foaming of ink as the pigment contained in ink is self-possessed.

MEANS

[Means for Solving the Problem] In order to solve such a problem, it sets to this invention. In the ink cartridge by which the ink feed hopper which supplies ink to a recording head was formed in one field of the container which forms an ink hold room, and said container The passage which a wall divides [passage] said ink hold room into Omuro with one large volume and areole with the small volume of another side, said ink feed hopper is prepared [passage] so that it may be open for free passage to said areole, and makes ink flow into areole from said Omuro's pars basilaris ossis occipitalis is formed.

OPERATION

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[0018] ***** in areole 2b can be stopped much more certainly by even a wall's 10 extending the base 20 which constitutes a differential pressure regulating valve 10 as furthermore shown in drawing 6 , and narrowing width of face W of the migration direction of areole 2b by the technique of inserting in packing.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the assembly perspective view showing one example of the ink cartridge of this invention.

[Drawing 2] Drawing (b) and (b) are the sectional views showing one example of an ink cartridge same as the above, respectively.

[Drawing 3] Drawing (b) and (b) are drawings showing one example of the differential pressure regulating valve held in the ink cartridge same as the above with a clausilium condition in the state of valve opening.

[Drawing 4] Drawing (b) and (b) are the sectional views showing other examples of the ink cartridge of this invention, respectively.

[Drawing 5] It is the sectional view showing other examples of the ink cartridge of this invention.

[Drawing 6] It is drawing showing other examples of this invention with the cross-section structure of areole.

[Description of Notations]

1 Container

2 Ink Hold Room

2a Omuro

2b Areole

3 Wall

4 Ink Feed Hopper

5 Packing

6 Film

7 Eight Septum

9 Lid

10 Differential Pressure Regulating Valve

17 Passage

18 Filter

19 Floating Body

(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号
特開2002-205413
(P2002-205413A)

(43)公開日 平成14年7月23日(2002.7.23)

(51)Int.Cl.⁷

識別記号

F I

テ-マ-ト*(参考)

B 4 1 J 2/175

B 4 1 J 3/04

1 0 2 Z 2 C 0 5 6

審査請求 未請求 請求項の数5 O L (全 4 頁)

(21)出願番号 特願2001-3412(P2001-3412)

(22)出願日 平成13年1月11日(2001.1.11)

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Fターム(参考) 2C056 EA15 FA10 KB05 KB08 KB27

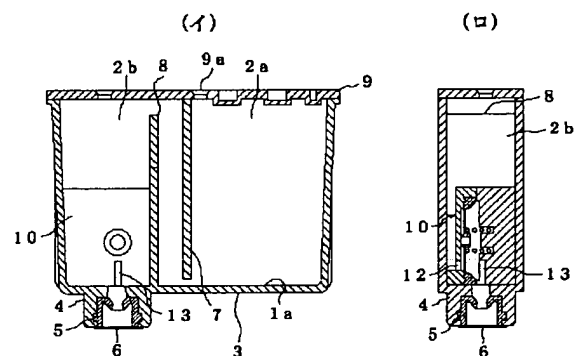
KCD1 KC13 KC27 KD02

(54)【発明の名称】 インクカートリッジ

(57)【要約】

【課題】 インクに含まれている顔料の沈着と、インクの泡立ちを防止することができる顔料インクに適したインクカートリッジを提供すること。

【解決手段】 インク収容室を一方の容積が大きい大室1aと、他方の容積が小さい小室1bとに壁により分割し、小室1bに連通するようにインク供給口4を設け、かつ大室1aの底部から小室1bにインクを流入させる流路11が形成されている。



【特許請求の範囲】

【請求項1】 インク収容室を形成する容器と、前記容器の1つの面に記録ヘッドにインクを供給するインク供給口が形成されたインクカートリッジにおいて、前記インク収容室を一方の容積が大きい大室と、他方の容積が小さい小室とに壁により分割し、前記小室に連通するように前記インク供給口を設け、かつ前記大室の底部から小室にインクを流入させる流路が形成されているインクカートリッジ。

【請求項2】 前記流路にフィルタが配置されている請求項1に記載のインクカートリッジ。

【請求項3】 少なくとも前記大室に浮体が配置されている請求項1に記載のインクカートリッジ。

【請求項4】 前記小室の前記キャリッジの移動方向の幅が、前記大室の幅よりも狭く形成されている請求項1に記載のインクカートリッジ。

【請求項5】 前記インク供給口と前記小室とが、差圧弁を介して接続されている請求項1に記載のインクカートリッジ。

【発明の詳細な説明】

【0001】

【発明が属する技術の分野】本発明は、キャリッジに搭載され、インクジェット記録ヘッドにインクを供給するインクカートリッジに関する。

【0002】

【従来の技術】インクカートリッジをキャリッジに搭載したインクジェット記録装置にあっては、キャリッジの往復動によりインクカートリッジに大きな加速度が作用してインクに泡立ちが生じるという問題がある。このような問題を解消するため、インク貯蔵室の少なくともインク供給口側の領域にインクを毛細管力で保持することができる多孔質体を収容したインクカートリッジが提案されている。

【0003】

【発明が解決しようとする課題】一方、インクの発色性や耐光性の向上を図るため、着色微粒子をインク溶媒に懸垂状態で混合したいわゆる顔料インクも実用化されようとしている。このような微粒子を含むインクにあっては、インクに含まれている顔料が多孔質体に沈着しやすく、記録ヘッドに供給されるインクの発色性が低下するという問題がある。本発明はこのような問題に鑑みてなされたものであってその目的とするところは、インクに含まれている顔料の沈着と、インクの泡立ちを防止することができる顔料インクに適したインクカートリッジを提供することである。

【0004】

【課題を解決するための手段】このような問題を解消するために本発明においては、インク収容室を形成する容器と、前記容器の1つの面に記録ヘッドにインクを供給するインク供給口が形成されたインクカートリッジにお

いて、前記インク収容室を一方の容積が大きい大室と、他方の容積が小さい小室とに壁により分割し、前記小室に連通するように前記インク供給口を設け、かつ前記大室の底部から小室にインクを流入させる流路が形成されている。

【0005】

【作用】大室の底部の泡を含まないインクを小室に補給するとともに、小室の波立ちを抑えて記録ヘッドに供給するインクの泡立ちを防止する。

【0006】

【発明の実施の形態】図1、図2は、それぞれ本発明のインクカートリッジの一実施例を示すものであって、開口側が若干未広がりとなるほぼ直方体の高分子材料を射出成形して構成された容器1にインク収容室2が形成され、底部3に記録ヘッドのインク供給針と係合するインク供給口4が形成されている。

【0007】インク供給口4には、記録ヘッドに連通するインク供給針と液密に係合する環状のパッキン5が装填され、外側をインク供給針の挿通が可能なフィルム6により封止されている。

【0008】インク収容室2は、それぞれ2枚の隔壁7、8により大室2aと小室2bとにサイホン現象でインクが移動可能に分離されている。すなわち大室側に位置する隔壁7は、蓋体9の裏面により上部を封止され、底部3で開口し、また小室側に位置する隔壁8は、底部3から延びて上部が開口するように、好ましくは容器1と一体に形成されている。このように分離された小室2bは、後述する差圧弁10を介してインク供給口4に連通されている。なお、大室2aは、蓋体9の大気連通孔9aを介して大気に開放されている。

【0009】図3（イ）、（ロ）は、前述の差圧弁10の一実施例を、閉弁状態及び開弁状態で示すものであって、インク流入口11とインク流出口12の間にはパネ13によりインク流入口11の側に常時付勢され、かつ中心に貫通孔14を備えた弁体15と、弁体15の貫通孔14を封止する弁座16とにより構成されている。

【0010】このように構成された差圧弁10は、記録ヘッドでインクが消費されると、インク流出口12の圧力が低下するため、弁体15がパネ13の付勢力に抗して図3（ロ）に示したように弁座16から離れて開弁する。

【0011】また、インク流出口12の圧力がパネ13により設定されている差圧に一致するまで上昇すると、図3（イ）に示したように弁体15がパネ13の付勢力に負けて弁座16に弾接されて閉弁する。

【0012】この実施例において、インクカートリッジをキャリッジに搭載して印刷を開始すると、キャリッジの往復動により各室2a、2bのインクに加速度が作用するが、小室2bのインクの揺動が少ないため泡立ちをほとんど生じない（図4（イ））。一方、大室2aでは

インクが波立つため、気泡が発生するものの、顔料の沈殿が可及的に防止される。

【0013】印刷に伴って小室2bのインクが記録ヘッドにより消費されると、差圧弁10が開弁して小室2bのインクが消費される。小室2bのインクの消費が進むと、2枚の隔壁7、8により区画形成された流路17を介して大室2aの底部のインクが小室2bに流れ込み、ついには大室2aの底部3と隔壁7の先端部においてインクが途切れる(図4(ロ))。もとより大室2aのインクKに泡が存在していても、底部1aの領域のインクが流れ込むため、大室2aの泡が小室2bに流れ込むようなことはない。

【0014】図5は、本発明の他の実施例を示すものであって、この実施例においては流路17の途中、この実施例では流路17の流入側側にフィルタ18が配置され、さらに好ましくは少なくとも大室2aに浮体19が配置されている。

【0015】この実施例によれば、フィルタ18により泡が排除され、また浮体19により大室2aのインクの波立ちが抑制されるから、記録ヘッドへの気泡の流入を一層確実に防止することができる。

【0016】なお、上述の実施例においては、単一のインク収容室2を形成したインクカートリッジについて説明したが、複数のインク室だけが形成されたインクカートリッジに適用しても同様の作用を奏する。また、上述の実施例においては、弁体15を垂直に配置しているが、水平方向に配置しても同様の作用を奏することは明らかである。

【0017】さらに、上述の実施例においては小室1bとインク供給口4とを差圧弁により連通させて記録ヘッドへのインクの供給圧を負圧に維持して記録ヘッドからのインクの漏洩を防止しているが、記録ヘッドのノズル開口のメニスカスによりインクを十分に保持できる場合には、差圧弁が不要となる。

【0018】さらに図6に示したように例えば差圧弁10を構成する基部20を壁10まで延長したり、また充填物を装入する等の手法により小室2bの移動方向の幅Wを狭くすることにより、小室2bでの波立ちを一層確実に抑えることができる。

【0019】

【発明の効果】以上説明したように本発明においては、

インク収容室を形成する容器と、容器の1つの面に記録ヘッドにインクを供給するインク供給口が形成されたインクカートリッジにおいて、インク収容室を一方の容積が大きい大室と、他方の容積が小さい小室とに壁により分割し、小室に連通するようにインク供給口を設け、かつ大室の底部から小室にインクを流入させる流路が形成されているので、大室の底部の泡を含まないインクを小室に補給するとともに、小室の波立ちを抑えて泡立ちを防止して記録ヘッドへの気泡の流入を防止することができる。また、大室でのインクの揺動を積極的に利用して顔料の沈殿を防止しつつ、記録ヘッドへのインクの流入を防止することができる。

【図面の簡単な説明】

【図1】本発明のインクカートリッジの一実施例を示す組立斜視図である。

【図2】図(イ)、(ロ)は、それぞれ同上インクカートリッジの一実施例を示す断面図である。

【図3】図(イ)、(ロ)は、同上インクカートリッジに収容されている差圧弁の一実施例を、閉弁状態と開弁状態で示す図である。

【図4】図(イ)、(ロ)は、それぞれ本発明のインクカートリッジの他の実施例を示す断面図である。

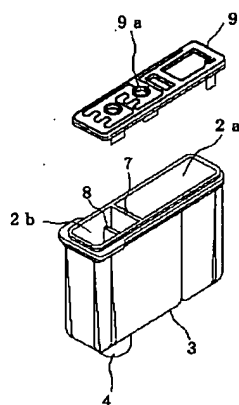
【図5】本発明のインクカートリッジの他の実施例を示す断面図である。

【図6】本発明の他の実施例を小室の断面構造で示す図である。

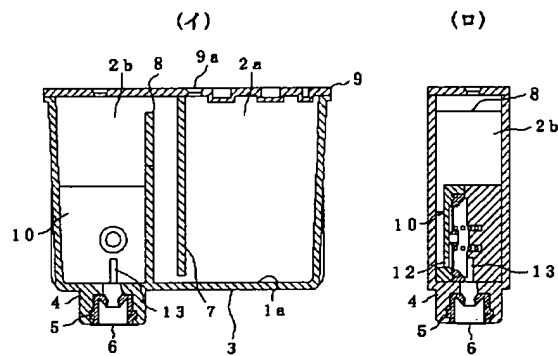
【符号の説明】

- 1 容器
- 2 インク収容室
- 2a 大室
- 2b 小室
- 3 壁
- 4 インク供給口
- 5 パッキン
- 6 フィルム
- 7、8 隔壁
- 9 蓋体
- 10 差圧弁
- 17 流路
- 18 フィルタ
- 19 浮体

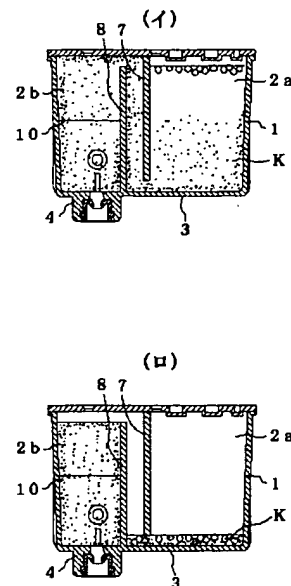
【図1】



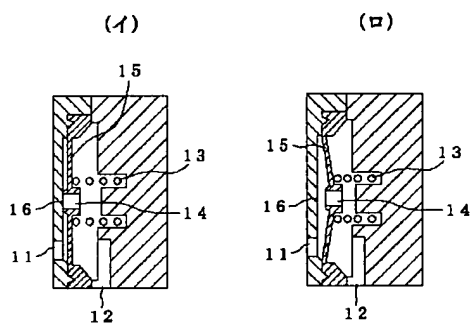
【図2】



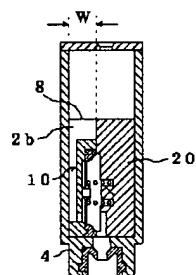
【図4】



【図3】



【図6】



【図5】

